CLAIMS

1. We Claim that this invention is a process to create tremendously vigorous chemical reaction with Nitric Acid and iron scrap even though it is known that the chemical reaction with Nitric acid and iron is very slow and ultimately stops due to passivation problem.

2. We claim that during the vigorous reaction, the resultant product is micronised high-purity magnetic grade hydrated Ferric Oxide $Fe_2O_3.H_2O$ dispersion in acidic water media and Oxides of Nitrogen gases evolve. The reactants are Nitric acid, Iron scraps, Water and Air (oxygen).

3. We claim that the heating process of the chemical reaction is regulated to get a temperature to attain vigorous reaction and some small pressure is also applied. As the reaction is exothermic, the temperature is properly controlled so that the product will be hydrated Ferric Oxide $Fe_2O_3.H_2O$ dispersion and not Ferric Nitrate solution. The brownish yellow color of the dispersion gets darker shade at higher temperature and that is to be avoided. At the same time, the temperature should be controlled to not fall below the suitable level.

4. We claim that chemical purification is not required to get 98% pure Ferric Oxide. However, mechanical purification is required to remove iron and dust particles of iron

scrap, and finally a micron filter is used, though the scraps are thoroughly washed before feeding into the reactor. The Hydrated Ferric Oxide $Fe_2O_3.H_2O$ dispersion product from the reactor is passed through series of similar reactors that maintains similar conditions so as to get negligible acidity in the dispersion product.

5. We claim that By-products like organic or inorganic ***nitrates*** can be produced by absorbing the exit gases containing Oxides of Nitrogen, Air (oxygen), water vapor or steam in suitable absorbent according to commercial demand. If necessary, the exit gases mainly Oxides of Nitrogen can be sent to *nitric acid plant* for reuse in above reaction.